COURSE NUMBER: FHWA-NHI-134001 (2-Day)
FHWA-NHI-134001A (3-Day)
FHWA-NHI-134001B (4-Day)
FHWA-NHI-134001C (5-Day)

COURSE TITLE: Principles of Writing Highway Construction Specifications

This course addresses the engineering and legal aspects and linguistics of writing specifications. THIS IS NOT A COURSE IN TECHNICAL WRITING! The course addresses issues of how to draft new specifications or rewrite existing ones in clear, readable, and definitive statements of contract requirements. Classroom activities include lectures, case studies, workshops, and writing assignments.

The course covers method and end-result specifications; innovative methods to deliver, procure, and manage construction; general provisions and a section on end-result related specifications. The course also includes a discussion of the importance of obtaining feedback from all the entities involved in interpreting and using the specifications in order to make them work better in the field.

An additional resource for highway specifications: The National Highway Specifications Web site is now available at www.specs.fhwa.dot.gov

OUTCOMES:

Upon completion of the course, participants will be able to:

- Recognize and apply the principles of writing clear, concise, complete, and technically correct specifications
- Write specifications in the active voice imperative mood
- Write specifications without ambiguities and with measurable standards
- Describe the difference between traditional methods specifications and statistically based quality assurance specifications
- Identify newer types of procurement and contracting methods
- Demonstrate appreciation for the importance of specifications for highway construction contracting

TARGET AUDIENCE:

Personnel working in contract administration, design, materials selection and quality control, and the management of highway construction, including contribution of information in contract provisions. This includes specification writers who use the information in writing the formal contract documents.

PREREQUISITES: This course is not for beginners! Participants must have experience (five years minimum) in at least one of the following disciplines: contract administration, materials, specification writing, roadway or bridge design, roadway or bridge construction.

For this course, fees and lengths are shown on page 72.
This course can be taught in different course length formats.
See our Web site for details on each course length.

FEE: $270 Per Participant
LENGTH: 2.0 Days (CEU: 1.2 Units)

FEE: $400 Per Participant
LENGTH: 3.0 Days (CEU: 1.8 Units)

FEE: $530 Per Participant
LENGTH: 4.0 Days (CEU: 2.4 Units)

FEE: $650 Per Participant
LENGTH: 5.0 Days (CEU: 3.0 Units)
CLASS SIZE: Minimum: 20; Maximum: 30

NHI Training Program Manager: Larry Jones • (703) 235-0523 • larry.jones@fhwa.dot.gov
Technical Information: Ken Jacoby • (202) 366-6503 • ken.jacoby@fhwa.dot.gov

You don't need to be a government agency to host a course. For instructions on how to host a course, please see page 7.

COURSE NUMBER: FHWA-NHI-134005
COURSE TITLE: Value Engineering Workshop

Value engineering is the systematic process of review and analysis of a project during its design/development phase to provide suggestions for reducing its total cost while providing an equal or better quality project. A value engineering review is made by a multidisciplined team who: (1) investigate/analyze the design of an existing project; (2) analyze project functions and costs; (3) creatively speculate on alternative ways to perform the various functions; (4) evaluate the best and/or least life-cycle alternatives; (5) develop acceptable alternatives into fully supported recommendations; and (6) present the team's recommendations to management. This workshop provides the value engineering education necessary for the participants to successfully participate in future value studies. It also encourages formation of interactive value engineering teams at the State and division office levels. The workshop incorporates value analysis of actual projects furnished by the host agency.

OUTCOMES:

Upon completion of the course, participants will be able to:

- Recognize the difference between value engineering and other cost-reduction or problem-solving techniques
- Identify areas where the application of value engineering techniques have potential for savings in financial or material resources
- Participate in a value engineering team and provide guidance to team members who have less experience
- Support the use of value engineering, recognizing it as a management tool for product improvement and cost reduction

TARGET AUDIENCE:

Professional and technical staff of FHWA and State highway/transportation departments, including officials of local transportation agencies involved in recurrent Federal-aid work.

FEE: $650 Per Participant

LENGTH: 5.0 Days (CEU: 3.0 Units)

CLASS SIZE: Minimum: 20; Maximum: 30

NHI Training Program Manager: Lesley Bolden • (703) 235-0553 • lesley.bolden@fhwa.dot.gov
Technical Information: Donald Jackson • (202) 366-4630 • donald.jackson@fhwa.dot.gov

Ready to request a course? Please complete the On-Site Course Request Form (FWHA Form 1530) located in the back of the catalog or submit an electronic copy via the NHI Web site.

COURSE NUMBER: FHWA-NHI-134006
COURSE TITLE: Highway/Utility Issues

This course is designed to include participants from highway agencies and from utilities. Hosting agencies should make every effort to ensure both are present.

This course presents the fundamentals of effective coordination of utility relocation and accommodation issues throughout the planning, design, construction, and maintenance phases of a highway project. Participants from both highway and utility communities will be involved throughout the course, demonstrating their knowledge through workshops, exercises, and other activities. The course includes methods for measuring the attainment of learning objectives. Two instructors will facilitate the course, one experienced in highway matters, the other in utility matters.

OUTCOMES:

Upon completion of the course, participants will be able to:

- Locate utility issues and concerns during the project development process and flag opportunities for early coordination
- Identify the critical processes related to utilities for permits, relocation, and project construction
- Read a plan and profile sheet
- Use templates for creating a simple plan for establishing the proper traffic control plan (TCP)
- Describe successful practices that might be considered as options for each phase of a project

TARGET AUDIENCE:

Federal, State, and local highway agencies, and public/private utility companies responsible for highway/utility coordination.

FEE: $270 Per Participant

LENGTH: 2.0 Days (CEU: 1.2 Units)

CLASS SIZE: Minimum: 20; Maximum: 30

NHI Training Program Manager: Lesley Bolden • (703) 235-0553 • lesley.bolden@fhwa.dot.gov
Technical Information: Roger McClellan • (202) 366-6765 • roger.mcclellan@fhwa.dot.gov

Video conferencing technology can make instructor-led courses accessible to remote participants without changing the delivery format. Instruction is delivered to a video camera and broadcast to video conferencing sites in areas close to participants, eliminating or greatly reducing the need for travel. Contact Debbie Gwaltney at (202) 366-9379 or debbie.gwaltney@fhwa.dot.gov for more information.

COURSE NUMBER: FHWA-NHI-134029
COURSE TITLE: Bridge Maintenance Training

This course focuses on cost-effective bridge maintenance and repair procedures performed by typical transportation agency crews. Included are step-by-step instructions for preparing for and performing maintenance and repair on common bridge elements. Bridge preservation is emphasized throughout. While engineers often attend, the material is designed for bridge crew supervisors and technicians.

OUTCOMES:

Upon completion of the course, participants will be able to:

- Justify, develop and implement a cost-effective preservation strategy for a group of bridges
- Identify maintenance or repair needs and select the best remedial strategy. Understand properties and preservation options involving common bridge materials such as concrete, steel and timber
- Describe the step-by-step tasks required to accomplish proven preservation procedures on the various bridge elements
- Identify critical members and avoid procedures that might result in damage such as field welding repairs on fracture critical tension members
- Recognize problems that warrant specialized expertise, for example, soliciting the involvement of a qualified structural engineer when repairing structural damage
- Exercise effective management techniques (such as planning, scheduling, monitoring and reporting) during daily bridge maintenance operations.

TARGET AUDIENCE:

State and local bridge maintenance technicians and supervisors.

FEE: $530 Per Participant

LENGTH: 4.0 Days (CEU: 2.4 Units)

CLASS SIZE: Minimum: 20; Maximum: 30

NHI Training Program Manager: Lesley Bolden • (703) 235-0553 • lesley.bolden@fhwa.dot.gov
Technical Information: Wade F. Casey • (202) 366-4606 • wade.casey@fhwa.dot.gov

If your interested in this course, you may also want to take advantage of another NHI construction and maintenance course.

130088 Bridge Construction Inspection

COURSE NUMBER: FHWA-NHI-134037A
COURSE TITLE: Managing Highway Contract Claims: Analysis and Avoidance

NEW COURSE

This course is an updated version of a previously offered 3-day course on the subject of claims avoidance, claims handling, and preparation of legal actions by both the State and the individuals involved. The course is structured such that emphasis can be give to scheduling (using CPM) or to documentation and preparation of legal actions caused by claims. This option should be stated when requesting the course. The course manual and classroom instruction addresses the following areas:

1. Philosophy/Concept of Construction Contracting, Changes and Claims Competitive Bidding/Reliance on Plans and Specifications Why Claims Have Increased
2. Construction Contracts in Laymen's Language Basic Contract Principles Significant Contract Clauses Changes, Differing Site Conditions, Liquidated Damages, Suspension of Work, Termination, Inspection, Acceptance Indemnification Clauses
3. Strengths and Weaknesses of State Highway Contracts
4. Preparing Contract Documents
5. Contract Administration Directed and Constructive Changes Procedures (Notice, Equitable Adjustment/Force Account, Timeliness Scheduling Cost Evaluations6. Delay Claims/Inefficiency/Damages Exculpatory Language, Excusable and Inexcusable Delays Acceleration, Disruptions, Interferences, Performing Delay Analysis, Damage Calculations (mitigation)
7. Documentation and Record keeping Bid Documents, Periodic Reports, Schedules, Internal and External Correspondence, Photographs; Use asEvidence
8. Managing Claims Identification, Procedures, Preparation/Claim Defense Plan Strategy, Claim Presentation
9. Negotiation Timing, Strategy, Team Approach (Workshop)
10. Design Consultant Liability
11. Disputes Resolution Litigation, Arbitration, Administrative Procedures Alternate Disputes Resolution
12. How to Prepare for Trial/Arbitration Depositions, Trial, Preparation of Exhibits/Consultants Working with Attorneys

OUTCOMES:

Upon completion of the course, participants will be able to:

- Define the recommended terminology associated with claims and the accompanying dispute resolution process
- Identify the three key elements of a claim
- Determine whether or not a change has occurred
- Measure the impacts of the change
- Calculate the resultant cost of the change
- Explain the value of a systems approach to claims avoidance
- Identify the dispute resolution procedures available to the host

TARGET AUDIENCE:

This course is intended for FHWA, State, and local highway design and construction engineers, resident engineers, or individual one step above the project level involved in project development, specification writing, and individuals involved in the preparation for the defense of a construction claim.

FEE: $335 Per Participant

LENGTH: 2.5 Days (CEU: 1.5 Units)

CLASS SIZE: Minimum: 20; Maximum: 30

NHI Training Program Manager: Lesley Bolden • (703) 235-0553 • lesley.bolden@fhwa.dot.gov
Technical Information: Chris Newman • (202) 366-2023 • christopher.newman@fhwa.dot.gov

COURSE NUMBER: FHWA-NHI-134042
COURSE TITLE: Materials Control and Acceptance - Quality Assurance

The course provides participants with an understanding of the basic elements of a statistically based quality assurance program. The following sessions are included in the course: Introduction, Sampling Theory, Organization of Data, Analysis of Data, The Normal Distribution, Sources of Variability, Process Control, Acceptance Plans and Risks, Percent Within Limits Acceptance Plans, Implementation and Summary.

OUTCOMES:

Upon completion of the course, participants will be able to:

- Recognize the importance of organizing data, necessary forms of data organization, and how to plot frequency histograms
- Recognize how a sample relates to the population, including the myth of a single representative sample, establish and use random stratified sampling plans
- Calculate population and sample means standard deviations and coefficient of variation
- Recognize the relationship between single and multiple samples
- Recognize basic probability concepts, illustrate the relationship of histograms to probability density functions, and calculate areas under normal distribution curves
- Explain the meaning of the terms precision, accuracy, and bias
- Identify sources of variability and how to use precision and bias statements
- Develop and apply process control plans, including how to calculate control chart limits and to plot and interpret statistical control charts
- Recognize the strengths and weaknesses of acceptance plans based on sample means and percent within limits
- Recognize the different types of specifications and how they work, including the inputs to specifications and requirements for the use of contractors
- Recognize the elements of acceptance plans, including buyer and seller risks
- Recognize the elements of a quality assurance system

TARGET AUDIENCE:

Federal, State, and local highway agency engineers in materials, construction, research and other highway fields and technicians involved in specification development, laboratory, and field testing of highway materials.

FEE: $600 Per Participant

LENGTH: 4.5 Days (CEU: 2.7 Units)

CLASS SIZE: Minimum: 20; Maximum: 30

NHI Training Program Manager: Lesley Bolden • (703) 235-0553 • lesley.bolden@fhwa.dot.gov
Technical Information: Michael Rafalowski • (202) 366-1571 • michael.rafalowski@fhwa.dot.gov

Look on the inside back cover to read about the International Association for Continuing Education and Training (IACET).

COURSE NUMBER: FHWA-NHI-134049
COURSE TITLE: Use of Critical Path Method (CPM) for Estimating, Scheduling and Timely Completion

This training course is designed to educate State highway, FHWA, and industry project staff about the availability of effective construction and maintenance planning and scheduling tools that can help in providing visual representation of current project status, completed tasks, and expected completion of all activities. These tools can be focused to accelerate construction and minimize impact on the traveling public.

OUTCOMES:

Upon completion of the course, participants will be able to:

- Create a CPM chart for a sample project using these basic components: a project definition, milestones and a Gantt chart, work schedules (including work breakdown schedules), and an activity network
- Calculate resource needs and reserves, and propose resource leveling strategies
- Prepare a risk analysis/management plan for the sample project
- Use a complex CPM to determine the status of the project, identifying slack or float and delays
- Describe methods for managing multi-project scheduling

TARGET AUDIENCE:

Federal, State, local, and private contractor project engineers/managers and related field personnel.

FEE: $270 Per Participant

LENGTH: 2.0 Days (CEU: 1.2 Units)

CLASS SIZE: Minimum: 20; Maximum: 30

NHI Training Program Manager: Lesley Bolden • (703) 235-0553 • lesley.bolden@fhwa.dot.gov
Technical Information: Celso Gatchalian • (202) 366-1342 • celso.gatchalian@fhwa.dot.gov

See page 182 for more information about Instructor Certification.

COURSE NUMBER: FHWA-NHI-134056
COURSE TITLE: Pontis Bridge Management

Pontis is a computer software program, owned and licensed by AASHTO, designed to assist bridge managers and practitioners in analyzing bridge data to predict future bridge conditions and needs, determine optimal policies, and recommend projects and schedules within budget and policy limitations. The course covers entering and editing inspection data, developing a bridge preservation policy, performing bridge network level analyses, developing bridge projects, running Pontis reports, and refining Pontis results. The course focuses on an agency's business process steps, key concepts of bridge management and their application to Pontis, using the software, instructor demonstration exercises, and practical student exercises. Each participant will receive a participant notebook. Six laptop computers containing the PONTIS 4.3 software and sample training database are furnished by the NHI for use in the training course.

In addition to the 2.5-day training, a 2-hour session has been developed as part of the course to serve as an introduction to the attributes and benefits of the Pontis program. This introduction is designed for Federal, State and local executives and upper- and mid-level highway agency professionals responsible for an agency's bridge/highway program. Executives and management officials are encouraged to attend the opening introduction and overview sessions.

OUTCOMES:

Upon completion of the course, participants will be able to:

- Use Pontis to support bridge management
- View, enter, and edit bridge inspection and inventory data
- Develop, update, optimize, and interpret a preservation policy
- Enter program simulation inputs, run network analyses and interpret results
- Create and rank bridge projects
- Generate and interpret reports
- Customize Pontis to support agency business practices

TARGET AUDIENCE:

This course is designed for bridge program managers, bridge management engineers, bridge maintenance engineers, bridge inspectors, and project planning and programming personnel.

FEE: $335 Per Participant

LENGTH: 2.5 Days (CEU: 1.5 Units)

CLASS SIZE: Minimum: 10; Maximum: 20

NHI Training Program Manager: Lesley Bolden • (703) 235-0553 • lesley.bolden@fhwa.dot.gov
Technical Information: Wade Casey • (202) 366-4606 • wade.casey@fhwa.dot.gov

With NHI courses, learn new skills that can be quickly applied to your job.

COURSE NUMBER: FHWA-NHI-134058
COURSE TITLE: Alternative Contracting

NEW COURSE

This course addresses the legal aspects, and potential program implications of using alternative project delivery strategies and nontraditional contracting practices. This includes alternative project delivery methods such as design-build, construction manager at risk, and performance contracting. It also includes the use of nontraditional contracting provisions such as warranties, multiparameter bidding, incentive-disincentive provisions for contract time, lane rental, alternate pavement type bidding, and many other nontraditional contracting techniques. The course has certain required modules; however, the requesting agency may customize the course by selecting from additional modules. Classroom activities include lectures, case studies, workshops, and writing assignments.

OUTCOMES:

Upon completion of the course, participants will be able to:

- Identify alternative project delivery, procurement, and contract management methods for highway construction
- Identify objectives for the use of alternative project delivery, procurement, and contract management methods
- Differentiate among traditional design-bid-build and alternative project delivery, procurement, and contract management methods based on relative advantages and risks
- Define how project risks are reallocated using various project delivery, procurement, and contract management methods
- Select appropriate alternative contracting methods for use with a given project or select appropriate projects for use with a given alternative contracting method or methods
- Idenitify contract requirements appropriate for alternative contracting methods

TARGET AUDIENCE:

Personnel working in contract administration, project development and design, and the management of highway construction, including contribution of information in contract provisions.

FEE: $270 Per Participant

LENGTH: 2.0 Days (CEU: 1.2 Units)

CLASS SIZE: Minimum: 20; Maximum: 30

NHI Training Program Manager: Lesley Bolden • (703) 235-0553 • lesley.bolden@fhwa.dot.gov
Technical Information: Jerry Yakowenko • (202) 366-1562 • gerald.yakowenko@fhwa.dot.gov

We want to hear from you about the NHI catalog. Please complete the catalog survey card in the back of the catalog.